What is claimed is:

1. In a combined optical data-electrical data switch fabric system, a method of more fully utilizing the available data flow capacity of optical paths through the optical switch fabric, that comprises, flowing photonic data packets along a predetermined optical path in the optical switch fabric; flowing other data packets along a separate data flow path; determining when the predetermined optical path is under-utilized in its available data flow capability and the desirability of inserting in that predetermined optical path additional data from the separate data flow path; diverting the photonic data packet flow along said predetermined path into the electrical switch fabric and converting the same into electrical data packets; joining the converted electrical data packets with said other data packets also presented in electrical data packet form; converting the joined electrical data packets into photonic data packet flow; and sending the converted joined photonic data packets along said predetermined optical path of the optical switch fabric.

2. The method of claim 1 wherein said other data packets are electrical data packets inputted to the electrical switch fabric, and such are joined with the electrical data packets converted from the diverted photonic data of the optical switch fabric, with the joined electrical data packets converted into photonic data and applied to said predetermined optical path such that the predetermined path is additionally utilized by the supplement of the electrical switch fabric electrical data packets.

3. The method of claim 1 wherein said other data packets are photonic data packets from a further optical path in the optical switch fabric, and, after conversion to electrical data packets, are joined with the electrical data packets converted in the electrical switch fabric from the diverted photonic data of the predetermined optical path, with the joined packets then converted back to photonic data and applied to said predetermined optical path, such that the predetermined optical path is additionally utilized by the supplement of data of the further optical path.

4. The method of claim 2 wherein the converting steps allow data packet processing capability to be present for the switch fabrics such as to allow for the processing of data traffic at the data packet level or as an optical wavelength.

5. The method of claim 2 wherein the electrical switch fabric and optical switch fabric are operated with a common software control plane as an integrated node processing both packet and optical connections.

6. The method of claim 5 wherein said software enables data traffic to be diverted from the optical domain into the electrical domain, combined with supplemental data traffic in the electrical domain, and then inserted back into the optical domain with the shortest path flow.

7. The method of claim 2 wherein, through the converting steps, a wavelength capable interfacing can be connected to the electrical switch fabric and serve as a packet-capable interfacing.

8. The method of claim 7 wherein such wavelength capable interfacing is connected or disconnected to or from the electrical switch fabric by controlling the switching of the optical switch fabric.

9. The method of claim 8 wherein such wavelength capable interfacing provide flexibility to changing data traffic demands and better utilization of optical data flow resources.

10. The method of claim 2 wherein the connecting steps also involve employing embedded routing intelligence for routing the packet traffic.

11. The method of claim 10 wherein a converting step takes data encoded in a wavelength and outputs a packet in the electrical domain while determining where the packet is next to be sent.

12. The method of claim 11 wherein a TLV type message is used to disseminate to other nodes information about said converting.

13. The method of claim 12 wherein an optical node is informed as to what kind of traffic is being transported over the optical connections.

14. The method of claim 2 wherein the combined system, through the use of said converting steps, can be configured as a node with N electrical links, M optical links and C converting elements, as well as a node with N + C electrical links and M - C optical links.

15. The method of claim 10 wherein said intelligence is provided to the optical node, allowing it to adapt its configuration to suit the needs of the packet traffic data carried along its optical paths.

16. A combined optical data-electrical data switch fabric system, for more fully utilizing the available data flow capacity of optical paths through the optical switch fabric, having, in combination, an ingress for flowing photonic data packets along a predetermined optical path in the optical switch fabric; an ingress for flowing other data packets along a separate data flow path; means for

determining when the predetermined optical path is under-utilized in its available data flow capability and the desirability of inserting in that predetermined optical path additional data from the separate data flow path; means for diverting the photonic data packet flow along said predetermined path into the electrical switch fabric and converting the same into electrical data packets; means for joining the converted electrical data packets with said other data packets also presented in electrical data packet form; means for converting the joined electrical data packets into photonic data packet flow; and means for sending the converted joined photonic data packets along said predetermined optical path of the optical switch fabric.

17. The system of claim 16 wherein said other data packets are electrical data packets inputted along the first-named ingress to the electrical switch fabric, and such are joined with the electrical data packets converted from the diverted photonic data of the optical switch fabric, with the joined electrical data packets converted by said converting means into photonic data and applied to said predetermined optical path such that the predetermined path is additionally utilized by the supplement of the electrical switch fabric electrical data packets.

18. The system of claim 16 wherein said other data packets are photonic data packets from a further optical path in the optical switch fabric, and, after conversion to electrical data packets, are joined with the electrical data packets converted in the electrical switch fabric from the diverted photonic data of the predetermined optical path, with the joined packets then converted by said converting means back to photonic data and applied to said predetermined

optical path, such that the predetermined optical path is additionally utilized by the supplement of data of the further optical path.

19. The system of claim 17 wherein there is further provided data packet processing means for the switch fabrics such as to allow for the processing of data traffic at the data packet level or as an optical wavelength.

20. The system of claim 17 wherein there is further provided for the electrical switch fabric and optical switch fabric operation, a common software control plane serving as an integrated node processing both packet and optical connections.

21. The system of claim 20 wherein said software enables data traffic to be diverted from the optical domain into the electrical domain, combined by said joining means with supplemental data traffic in the electrical domain, and then inserted back into the optical domain with the shortest path flow.

22. The system of claim 17 wherein, through the converting means, a wavelength capable interfacing can be connected to the electrical switch fabric and serve as a packet-capable interfacing.

23. The system of claim 22 wherein such wavelength capable interfacing is connected or disconnected to or from the electrical switch fabric by means for controlling the switching of the optical switch fabric.

24. The system of claim 23 wherein there is provided such wavelength capable interfacing for enabling flexibility in changing data traffic demands and better utilization of optical data flow resources.

25. The system of claim 17 wherein means is provided for employing embedded routing intelligence for routing the packet traffic.

26. The system of claim 25 wherein means is provided for taking data encoded in a wavelength and outputting a packet converted to the electrical domain while determining where the packet is next to be sent.

27. The system of claim 26 wherein a TLV type messenger is used to disseminate to other nodes information about the converting.

28. The system of claim 27 wherein means is provided for informing an optical node as to what kind of traffic is being transported over the optical connections.

29. The system of claim 17 wherein the combined system, through the use of said converting means, can be configured as a node with N electrical links, M optical links and C converting elements, as well as a node with N + C electrical links and M - C optical links.

30. The system of claim 25 wherein there is means for providing said intelligence to the optical node, allowing it to adapt its configuration to suit the needs of the packet traffic data carried along its optical paths.

31. Combined photonic and electronic data packet-based network node, unified and integrated as a single device and having a common software control plane including photonic-to-electronic data and electronic data-to-photonic converters, enabling increased utilization of such combined network node and in particular of optical path flow capacity.